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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Brent J. Bos, Stephen J. Forbes and Roger L. Veldman

For : VEHICLE INSTRUMENTATION/CONSOLE LIGHTING

Box Patent Application
Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

PRELIMINARY AMENDMENT

Prior to examination, Applicants request entry of the following amendments to the above-captioned application enclosed herewith.

IN THE TITLE:

Please amend the title to --INTERIOR MIRROR ASSEMBLY FOR A VEHICLE INCORPORATING A SOLID-STATE LIGHT SOURCE--

IN THE SPECIFICATION:

Page 1, between lines 1 and 2, please insert:

--CROSS REFERENCE TO RELATED APPLICATIONS

This is a continuation of co-pending application Serial No. 09/626,608, filed July 27, 2000, by Brent J. Bos, Stephen J. Forbes and Roger L. Veldman, entitled VEHICLE INSTRUMENTATION/CONSOLE LIGHTING, which is a continuation of Serial No. 09/287,926, filed April 7, 1999, now U.S. Patent No. 6,139,172, which is a continuation of Serial No. 08/937,480, filed September 25, 1997, now U.S. Patent No. 5,938,321, which is a continuation of application Serial No. 08/367,844, filed December 30, 1994, now United States Patent No. 5,671,996, the disclosures of which are hereby incorporated by reference herein.--

Page 12, lines 1-20, please delete the entire paragraph and substitute the following paragraph therefor:

--As shown in Fig. 7, when connected via circuit 70 to connector block 62 and the power system of the vehicle in which the mirror assembly 10 is mounted, light emitting source such as diode 90 provides a directed pattern of light of low level intensity for illuminating the desired area of the vehicle such as the center console including the transmission shift lever (Fig. 2) without creating glare visible by the driver of the vehicle in which the assembly is mounted. The diode provides continuous illumination of the desired areas without requiring backlit, individual lighting on the instrumentation or controls, without generating significant heat, and without producing unwanted glare. As shown in Fig. 8, light emitting diode 90 and resistor 92 may be connected in series in circuit 60 to the power system of the vehicle which includes a door operated switch 110 for alternate operation of lamp assemblies 24, 26 with manual switches 68a, 68b, and an ignition switch 112 which controls actuation of the diode. The vehicle power system is typically connected to a 12-volt DC battery, as illustrated. Thus, in this circuit, if the door of the vehicle is opened as shown in Fig. 8, power will be directed to the general illumination lamps 39 forming parts of lamp assemblies 24, 26 described above. In the event switches 68a, 68b are moved to their alternate positions, lamps 39 will be lighted regardless of whether the vehicle door is opened or closed. Light emitting diode 90 is operated by the closing of ignition switch 112 to either its accessory on or ignition on position and provides constant illumination of the desired instrument panel and/or console area of the vehicle interior at all times when the ignition switch is turned to the ignition on position or to the accessory on position.--

Page 12, lines 21-30, please delete the entire paragraph and substitute the following paragraph therefor:

--Alternately, light emitting diode 90 and resistor 92 may be connected in series to the power system of the vehicle through a rheostat/dimmer switch 116 located, for example, at the headlight control switch 114. In this version, 60' (Fig. 9) general illumination lamps 39 are controlled in the same manner as described above by door switch 110 or the manual control switches 68a, 68b. Light emitting diode 90 is controlled by rheostat/dimmer switch 116. The intensity of the light provided by diode 90 may be changed by rheostat/dimmer switch 116. Headlights 115 are separately controlled with switch 114 typically mounted in conjunction with rheostat 116. Accordingly, the low level illumination provided by light emitting diode 90 may be variously controlled to operate at all times during vehicle operation or as desired through a separate rheostat control switch.--

Page 13, lines 1-29, please delete the entire paragraph and substitute the following paragraph therefor:

--sources such as light emitting diodes 90', 90a' of the type described above in connection with assembly 10. Assembly 120 includes a mirror case 12', actuator assembly 18', lamp assemblies 24', 26' operated by switches 68a', 68b' all substantially similar to those described above in connection with assembly 10. Instead of a single light emitting source 90, however, assembly 120 includes two light emitting diodes 90', 90a' positioned at opposite ends of the mirror case as shown in Fig. 11. Each light emitting diode 90', 90a' is telescopingly mounted in a hollow, cylindrical adapter 94', 94a' as described above in connection with assembly 10, and as shown in Fig. 6. Diode 90', when mounted in its adapter 94', is directed to provide low level illumination of, for example, the center or shift lever console 125 and instrument panel areas of the vehicle while diode 90a' when mounted in its adapter 94a' is directed more sharply toward the instrument panel area 130 in front of the vehicle driver. In some vehicles, a floor console is located at the position of the shift lever console, and the diode 90' will illuminate that console. Also, various controls may be located in a console area on the side door such as at 134 in Fig. 10 and diode 90a' may be directed from mirror assembly 120 to illuminate such areas as well. Alternately, one or more of the diodes could be mounted in case 120 and directed upwardly against a roof mounted header or headliner console as shown at 136 in Fig. 10. The positions of the light as directed by the diodes can, of course, be adjusted by moving the mirror assembly on its support. Each diode also includes an electrical resistor 92', 92a' connected in series therewith as described above in connection with assembly 10. Alternately, diodes 90' and 90a' can both be connected in series with a common resistor, the ignition/battery voltage of the vehicle being applied across the series connection of the voltage dividing resistor and the two LEDs. The diodes in assembly 120 are connected in parallel from connector block 62a such that both will provide directed low level light as controlled by the ignition switch 112 or rheostat/dimmer switch 116 as described above in connection with Figs. 8 and 9. Accordingly, multiple low level light emitting sources can be incorporated in the interior rearview mirror assembly for directing low level illumination at desired, different areas of the vehicle interior. Alternately, multiple low level light emitting sources may be directed to illuminate the same target location in the vehicle to enhance intensity, uniformity and/or areal coverage of illumination.--

Page 14, lines 1-32, please delete the entire paragraph and substitute the following paragraph therefor:

--mirror support arm 154 is fixed in position and provides a single pivot for adjustment of the position of a rearview mirror assembly 156. Mirror assembly 156 may be any of a wide variety of interior rearview mirrors including manually operated, prismatic day/night mirrors as described in United States Patent Nos. 4,826,289 and 4,936,533, electrically operated prismatic day/night mirrors such as described in United States Patent No. 4,948,242, electrically operated, compass mirrors such as described in United States Patent No. 5,253,109, electrically operated, interior rearview mirrors incorporating map/reading lights such as those described above in assemblies 10 and 120, or as described in United States Patent Nos. 4,646,210, 4,733,336, 4,807,096 and 5,178,448, as well as electrically operated, automatically dimming mirrors as described in United States Patent Nos. 4,793,690, 4,799,768, 4,886,960 and 5,193,029, preferably electrochromic mirrors utilizing either solid state elements or electrochemichromic elements such as described in commonly-assigned, United States Patent Application No. 08/316,047, filed September 30, 1994, entitled MODULAR VARIABLE REFLECTANCE MIRROR ASSEMBLY, now United States Patent No. 5,659,423, or electrically operated memory interior rearview mirrors, the disclosures of all of such United States patents and patent applications being incorporated by reference herein. The low light emitting sources of this invention are preferably used in conjunction with electrically operated mirrors as this provides a convenient and economical method to incorporate the sources in the vehicle at a central, high-mounted location, by piggy-back connection to the existing ignition power lines(s) that carry ignition voltage to the electrically operated mirror. Location on or within an interior rearview mirror, and particularly such that the low-level source is emitting downwardly such as through the bottom of the mirror case, is particularly advantageous in its placement of the emitting source below the driver's line of sight so that the driver is largely unaware and unglared by the emitting source mounted on or within the mirror case. Pivot 155 is located at that lower, free end 157 of rigid support arm 154 while the upper end of the arm includes a breakaway assembly 158 adapted to release from a header-mounted plate 160 upon impact during an accident or the like. Breakaway assembly 158 and support arm 154 may take one of several forms such as that shown in co-pending, commonly-assigned, United States patent application Serial No. 08/336,296, filed November 8, 1994, invented by Richard R. Hook, entitled MIRROR

SUPPORT BRACKET, now United States Patent No. 5,615,857, or in commonly-assigned United States Patent No. 5,100,095, the disclosures of both of which are also hereby incorporated by reference herein.--

Page 15, lines 12-30, please delete the entire paragraph and substitute the following paragraph therefor:

--With reference to Figs. 14-16, a fourth embodiment of an interior rearview mirror assembly 180 incorporating a low level light emitting source of the present invention includes an interior rearview mirror 182 of the type shown or described above in connection with embodiments 10, 120 or 150 or others as are conventionally known in the vehicle industry. Mirror assembly 182 is adjustably supported by a double ball pivot assembly 182 such as that shown at 82 above in assembly 10. The double ball pivot arm 184 is connected to a windshield mount by means of a coupler or channel-mount 186 such as that described above at 84 in connection with assembly 10. Instead of mounting the low level light emitting source on the mirror assembly or the mounting arm for the mirror assembly, however, assembly 180 includes a separate instrument housing or pod 188 mounted on coupler 186 and including a low level light emitting source 190 projecting therefrom in a fixed position for illuminating a desired portion of the vehicle interior. Housing/pod 188 is preferably of the type shown and described in co-pending, commonly-assigned United States patent application Serial No. 08/195,353, filed February 10, 1994, entitled VEHICLE INFORMATION DISPLAY, invented by Rodney K. Blank et al., now United States Patent No. 5,576,687, the disclosure of which is hereby incorporated by reference herein. Such housing/pod may include displays such as compass, temperature and clock displays; sensors such as compass sensors, GPS sensors, automatic toll sensors, automatic headlamp dimmer sensors, and ambient light sensors; and lights such as incandescent lamps for general illumination within the vehicle.--

IN THE DRAWINGS:

Please revise Figs. 9 and 20 of the drawings as shown in the attached photocopies of the drawing figures. In Fig. 9, approval of the insertion of reference numeral 60', as shown in red, is requested. In addition, substitution of reference 288 for 286 to indicate the bayonet-type lamp or bulb, as shown in Fig. 20, is also requested. Accordingly,

approval of the above drawing changes is respectfully requested. These drawing changes were approved in the great-great-grandparent application, Serial No. 08/367,844.

IN THE ABSTRACT:

Page 32, lines 1-13, please delete the Abstract and substitute the following new Abstract:

--ABSTRACT

Illumination of a portion of a vehicle interior is provided by an interior rearview mirror assembly incorporating a solid-state light source comprising a light emitting diode (LED) which emits light generally downwardly from the assembly. In one form of the invention, the mirror case of the rearview mirror assembly includes at least one of an opening, a light conduit, and a fiberoptic element through which the LED emits light. In another form, the LED preferably has a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA. The LED preferably has a dominant wavelength of at least about 530 nm. The light emitted by the LED may be selected from green, orange, yellow, amber, reddish-orange, red and blue. The vehicle interior portion may include at least one of a shift lever console and a floor console.--

A new page including this amended Abstract is included.

IN THE CLAIMS:

Please cancel claims 1-83 without prejudice.

Please add the following new claims 84-218 prior to calculation of the filing fee.

84. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case, said case including a bottom portion;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source positioned for emitting light generally downwardly from said bottom portion of said mirror case when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered; and

wherein said mirror case includes at least one of:

a) an opening, said light emitting diode emitting light through said opening when powered,

b) a light conduit, said light emitting diode emitting light through said light conduit when powered, and

c) a fiberoptic element, said light emitting diode emitting light through said fiberoptic element when powered.

85. The mirror assembly of claim 84 wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered, said opening including a lens.

86. The mirror assembly of claim 85 wherein said lens closes said opening.

87. The mirror assembly of claim 85 wherein said lens snap-fits in said opening.

88. The mirror assembly of claim 85 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

89. The mirror assembly of claim 85 wherein said lens comprises a refractive optic.

90. The mirror assembly of claim 84 wherein said mirror case includes a light conduit, said light emitting diode emitting light through said light conduit when powered, said light conduit having an inner wall.

91. The mirror assembly of claim 90 wherein said inner wall is adapted to diffusely reflect light.

92. The mirror assembly of claim 91 wherein said inner wall comprises a diffuse reflecting material.

93. The mirror assembly of claim 90 wherein said inner wall is adapted to specularly reflect light.

94. The mirror assembly of claim 93 wherein said inner wall comprises a specularly reflecting material.

95. The mirror assembly of claim 90 wherein said light conduit is formed separate from said mirror case.

96. The mirror assembly of claim 90 wherein said light conduit is formed integral with said mirror case.

97. The mirror assembly of claim 96 wherein said light conduit is formed integral with said mirror case by molding.

98. The mirror assembly of claim 84 wherein said mirror case includes a fiberoptic element, said fiberoptic element comprising at least one of a fiberoptic cable and a fiberoptic bundle.

99. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

100. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

101. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode having a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

102. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

103. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 2 volts.

104. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

105. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

106. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

107. The mirror assembly of claim 106 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

108. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

109. The mirror assembly of claim 84 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

110. The mirror assembly of claim 84 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

111. The mirror assembly of claim 84 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

112. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

113. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

114. The mirror assembly of claim 84 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

115. The mirror assembly of claim 84 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header area of the vehicle for mounting said assembly on the vehicle.

116. The mirror assembly of claim 84 wherein said reflective mirror element comprises a prismatic rearview mirror element.

117. The mirror assembly of claim 84 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

118. The mirror assembly of claim 117 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

119. The mirror assembly of claim 84 wherein said portion includes a shift lever console.

120. The mirror assembly of claim 119 wherein said shift lever console comprises a transmission selector indicator panel.

121. The mirror assembly of claim 119 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

122. The mirror assembly of claim 119 wherein said shift lever console is located at the floor centerline of the vehicle.

123. The mirror assembly of claim 84 wherein said portion includes a floor console.

124. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case, said case including a bottom portion;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source positioned for emitting light generally downwardly from said bottom portion of said mirror case when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered;

wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered; and

wherein said light emitting diode emits light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

125. The mirror assembly of claim 124 wherein said opening includes a lens.

126. The mirror assembly of claim 125 wherein said lens closes said opening.

127. The mirror assembly of claim 125 wherein said lens snap-fits in said opening.

128. The mirror assembly of claim 125 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

129. The mirror assembly of claim 125 wherein said lens comprises a refractive optic.

130. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

131. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

132. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode having a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

133. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

134. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 2 volts.

135. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

136. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

137. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of amber and red.

138. The mirror assembly of claim 137 wherein said solid-state light source comprises a light

emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

139. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

140. The mirror assembly of claim 124 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

141. The mirror assembly of claim 124 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

142. The mirror assembly of claim 124 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

143. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

144. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

145. The mirror assembly of claim 124 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

146. The mirror assembly of claim 124 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header

area of the vehicle for mounting said assembly on the vehicle.

147. The mirror assembly of claim 124 wherein said reflective mirror element comprises a prismatic rearview mirror element.

148. The mirror assembly of claim 124 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

149. The mirror assembly of claim 148 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

150. The mirror assembly of claim 124 wherein said portion includes a shift lever console.

151. The mirror assembly of claim 150 wherein said shift lever console comprises a transmission selector indicator panel.

152. The mirror assembly of claim 150 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

153. The mirror assembly of claim 150 wherein said shift lever console is located at the floor centerline of the vehicle.

154. The mirror assembly of claim 124 wherein said portion includes a floor console.

155. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case, said case including a bottom portion;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source positioned for emitting light generally downwardly from said bottom portion of said mirror case when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a

portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered;

wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered; and

wherein said light emitting diode has a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

156. The mirror assembly of claim 155 wherein said opening includes a lens.

157. The mirror assembly of claim 156 wherein said lens closes said opening.

158. The mirror assembly of claim 156 wherein said lens snap-fits in said opening

159. The mirror assembly of claim 156 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

160. The mirror assembly of claim 156 wherein said lens comprises a refractive optic.

161. The mirror assembly of claim 155 wherein said light emitting diode emits light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

162. The mirror assembly of claim 155 wherein said light emitting diode has a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

163. The mirror assembly of claim 155 wherein said light emitting diode has a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

164. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

165. The mirror assembly of claim 155 wherein said solid-state light source comprises a light

emitting diode operated at a forward voltage of at least about 2 volts.

166. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

167. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

168. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of amber and red.

169. The mirror assembly of claim 168 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

170. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

171. The mirror assembly of claim 155 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

172. The mirror assembly of claim 155 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

173. The mirror assembly of claim 155 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

174. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

175. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

176. The mirror assembly of claim 155 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

177. The mirror assembly of claim 155 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header area of the vehicle for mounting said assembly on the vehicle.

178. The mirror assembly of claim 155 wherein said reflective mirror element comprises a prismatic rearview mirror element.

179. The mirror assembly of claim 155 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

180. The mirror assembly of claim 179 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

181. The mirror assembly of claim 155 wherein said portion includes a shift lever console.

182. The mirror assembly of claim 181 wherein said shift lever console comprises a transmission selector indicator panel.

183. The mirror assembly of claim 181 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

184. The mirror assembly of claim 181 wherein said shift lever console is located at the floor centerline of the vehicle.

185. The mirror assembly of claim 155 wherein said portion includes a floor console.

186. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source incorporated as part of said mirror assembly and positioned for emitting light generally downwardly from a bottom portion of said assembly when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered;

wherein said light emitting diode has a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

187. The mirror assembly of claim 186 wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered

188. The mirror assembly of claim 187 wherein said opening includes a lens.

189. The mirror assembly of claim 188 wherein said lens closes said opening.

190. The mirror assembly of claim 188 wherein said lens snap-fits in said opening.

191. The mirror assembly of claim 188 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

192. The mirror assembly of claim 188 wherein said lens comprises a refractive optic.

193. The mirror assembly of claim 186 wherein said light emitting diode emits light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

194. The mirror assembly of claim 186 wherein said light emitting diode has a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

195. The mirror assembly of claim 186 wherein said light emitting diode has a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

196. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

197. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 2 volts.

198. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

199. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

200. The mirror assembly of claim 199 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of amber and red.

201. The mirror assembly of claim 200 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

202. The mirror assembly of claim 186 wherein said solid-state light source comprises a light

emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

203. The mirror assembly of claim 186 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

204. The mirror assembly of claim 186 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

205. The mirror assembly of claim 186 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

206. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

207. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

208. The mirror assembly of claim 186 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

209. The mirror assembly of claim 186 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header area of the vehicle for mounting said assembly on the vehicle.

210. The mirror assembly of claim 186 wherein said reflective mirror element comprises a prismatic rearview mirror element.

211. The mirror assembly of claim 186 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

212. The mirror assembly of claim 211 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

213. The mirror assembly of claim 186 wherein said portion includes a shift lever console.

214. The mirror assembly of claim 213 wherein said shift lever console comprises a transmission selector indicator panel.

215. The mirror assembly of claim 213 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

216. The mirror assembly of claim 213 wherein said shift lever console is located at the floor centerline of the vehicle.

217. The mirror assembly of claim 186 wherein said portion includes a floor console.

218. The mirror assembly of claim 186 wherein said light emitting diode emits light with a dominant wavelength of at least about 530 nm.

REMARKS

Prior to examination, Applicants respectfully request that the amendments set forth above to the specification, drawings and claims, and the indicated Abstract, be entered in the application. The specification and drawing amendments are the same as those approved by the Examiners in the prior applications which are related to the present application, except for the correction of a typographical error at page 13, line 22. No new matter has been added by any of these amendments.

New claims 84-218 are presented for examination and are fully supported in the specification and drawings as filed, and in the specification and drawings of the prior related applications.

Examination and a Notice of Allowance for claims 84-218 is respectfully requested.

Respectfully submitted,

BRENT J. BOS ET AL.

By: Van Dyke, Gardner, Linn & Burkhart, LLP

FEBRUARY 25, 2002
Date

Donald S. Gardner
Donald S. Gardner
Registration No. 25 975
2851 Charlevoix Drive, S.E.
P.O. Box 888695
Grand Rapids, MI 49588-8695
(616) 975-5502

DSG/ram

ABSTRACT

Illumination of a target location of a vehicle interior is provided by an interior rearview mirror assembly incorporating a solid-state light source comprising a light emitting diode (LED) which emits light generally downwardly from the assembly. In one form of the invention, the mirror case of the rearview mirror assembly includes at least one of an opening, a light conduit, and a fiber optic element through which the LED emits light. In another form, the LED preferably has a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA. The LED may have a dominant wavelength of at least about 530 nm. The light emitted by the LED may be selected from green, orange, yellow, amber, reddish-orange, red and blue. The target location may include at least one of a shift lever console and a floor console.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Brent J. Bos, Stephen J. Forbes and Roger L. Veldman

For : VEHICLE INSTRUMENTATION/CONSOLE LIGHTING

Box Patent Application
Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Prior to examination, Applicants request entry of the following amendments to the above-captioned application enclosed herewith.

IN THE TITLE:

Please amend the title to --INTERIOR MIRROR ASSEMBLY FOR A VEHICLE INCORPORATING A SOLID-STATE LIGHT SOURCE--

IN THE SPECIFICATION:

Page 1, between lines 1 and 2, please insert:

--CROSS REFERENCE TO RELATED APPLICATIONS

This is a continuation of co-pending application Serial No. 09/626,608, filed July 27, 2000, by Brent J. Bos, Stephen J. Forbes and Roger L. Veldman, entitled VEHICLE INSTRUMENTATION/CONSOLE LIGHTING, which is a continuation of Serial No. 09/287,926, filed April 7, 1999, now U.S. Patent No. 6,139,172, which is a continuation of Serial No. 08/937,480, filed September 25, 1997, now U.S. Patent No. 5,938,321, which is a continuation of application Serial No. 08/367,844, filed December 30, 1994, now United States Patent No. 5,671,996, the disclosures of which are hereby incorporated by reference herein.--

Page 12, lines 1-20, please delete the entire paragraph and substitute the following paragraph therefor:

--As shown in Fig. 7, when connected via circuit 70 to connector block 62 and the power system of the vehicle in which the mirror assembly 10 is mounted, light emitting source such as diode 90 provides a directed pattern of light of low level intensity for illuminating the desired area of the vehicle such as the center console including the transmission shift lever (Fig. 2) without creating glare visible by the driver of the vehicle in which the assembly is mounted. The diode provides continuous illumination of the desired areas without requiring backlit, individual lighting on the instrumentation or controls, without generating significant heat, and without producing unwanted glare. As shown in Fig. 8, light emitting diode 90 and resistor 92 may be connected in series in circuit 60 to the power system of the vehicle which includes a door operated switch 110 for alternate operation of lamp assemblies 24, 26 with manual switches 68a, 68b, and an ignition switch 112 which controls actuation of the diode. The vehicle power system is typically connected to a 12-volt DC battery, as illustrated. Thus, in this circuit, if the door of the vehicle is opened as shown in Fig. 8, power will be directed to the general illumination lamps 39 forming parts of lamp assemblies 24, 26 described above. In the event switches 68a, 68b are moved to their alternate positions, lamps 39 will be lighted regardless of whether the vehicle door is opened or closed. Light emitting diode 90 is operated by the closing of ignition switch [12] 112 to either its accessory on or ignition on position and provides constant illumination of the desired instrument panel and/or console area of the vehicle interior at all times when the ignition switch is turned to the ignition on position or to the accessory on position.--

Page 12, lines 21-30, please delete the entire paragraph and substitute the following paragraph therefor:

--Alternately, light emitting diode 90 and resistor 92 may be connected in series to the power system of the vehicle through a rheostat/dimmer switch 116 located, for example, at the headlight control switch 114. In this version, 60' (Fig. 9) general illumination lamps 39 are controlled in the same manner as described above by door switch 110 or the manual control switches 68a, 68b. Light emitting diode 90 is controlled by rheostat/dimmer switch 116. The intensity of the light provided by diode 90 may be changed by rheostat/dimmer switch 116. Headlights 115 are separately controlled with switch 114 typically mounted in conjunction with rheostat 116. Accordingly, the low level illumination

provided by light emitting diode 90 may be variously controlled to operate at all times during vehicle operation or as desired through a separate rheostat control switch.--

Page 13, lines 1-29, please delete the entire paragraph and substitute the following paragraph therefor:

--sources such as light emitting diodes 90', 90a' of the type described above in connection with assembly 10. Assembly 120 includes a mirror case 12', actuator assembly 18', lamp assemblies 24', 26' operated by switches 68a', 68b' all substantially similar to those described above in connection with assembly 10. Instead of a single light emitting source 90, however, assembly 120 includes two light emitting diodes 90', 90a' positioned at opposite ends of the mirror case as shown in Fig. 11. Each light emitting diode 90', 90a' is telescopingly mounted in a hollow, cylindrical adapter 94', 94a' as described above in connection with assembly 10, and as shown in Fig. 6. Diode 90', when mounted in its adapter 94', is directed to provide low level illumination of, for example, the center or shift lever console 125 and instrument panel areas of the vehicle while diode 90a' when mounted in its adapter 94a' is directed more sharply toward the instrument panel area 130 in front of the vehicle driver. In some vehicles, a floor console is located at the position of the shift lever console, and the diode 90' will illuminate that console. Also, various controls may be located in a console area on the side door such as at 134 in Fig. 10 and diode 90a' may be directed from mirror assembly 120 to illuminate such areas as well. Alternately, one or more of the diodes could be mounted in case 120 and directed upwardly against a roof mounted header or headliner console as shown at 136 in Fig. 10. The positions of the light as directed by the diodes can, of course, be adjusted by moving the mirror assembly on its support. Each diode also includes an electrical resistor 92', 92a' connected in series therewith as described above in connection with assembly 10. Alternately, diodes 90' and 90a' can both be connected in series with a common resistor, the ignition/battery voltage of the vehicle being applied across the series connection of the voltage dividing resistor and the two [LED's] LEDs. The diodes in assembly 120 are connected in parallel from connector block 62a such that both will provide directed low level light as controlled by the ignition switch 112 or rheostat/dimmer switch 116 as described above in connection with Figs. 8 and 9. Accordingly, multiple low level light emitting sources can be incorporated in the interior rearview mirror assembly for directing low level illumination at desired, different areas of the vehicle interior. Alternately, multiple low level

light emitting sources may be directed to illuminate the same target location in the vehicle to enhance intensity, uniformity and/or areal coverage of illumination.--

Page 14, lines 1-32, please delete the entire paragraph and substitute the following paragraph therefor:

--mirror support arm 154 is fixed in position and provides a single pivot for adjustment of the position of a rearview mirror assembly 156. Mirror assembly 156 may be any of a wide variety of interior rearview mirrors including manually operated, prismatic day/night mirrors as described in United States Patent Nos. 4,826,289 and 4,936,533, electrically operated prismatic day/night mirrors such as described in United States Patent No. 4,948,242, electrically operated, compass mirrors such as described in United States Patent No. 5,253,109, electrically operated, interior rearview mirrors incorporating map/reading lights such as those described above in assemblies 10 and 120, or as described in United States Patent Nos. 4,646,210, 4,733,336, 4,807,096 and 5,178,448, as well as electrically operated, automatically dimming mirrors as described in United States Patent Nos. 4,793,690, 4,799,768, 4,886,960 and 5,193,029, preferably electrochromic mirrors utilizing either solid state elements or electrochemichromic elements such as described in commonly-assigned, United States Patent Application No. 08/316,047, filed September 30, 1994, entitled MODULAR VARIABLE REFLECTANCE MIRROR ASSEMBLY, now United States Patent No. 5,659,423, or electrically operated memory interior rearview mirrors, the disclosures of all of such United States patents and patent applications being incorporated by reference herein. The low light emitting sources of this invention are preferably used in conjunction with electrically operated mirrors as this provides a convenient and economical method to incorporate the sources in the vehicle at a central, high-mounted location, by piggy-back connection to the existing ignition power lines(s) that carry ignition voltage to the electrically operated mirror. Location on or within an interior rearview mirror, and particularly such that the low-level source is emitting downwardly such as through the bottom of the mirror case, is particularly advantageous in its placement of the emitting source below the driver's line of sight so that the driver is largely unaware and unglared by the emitting source mounted on or within the mirror case. Pivot 155 is located at that lower, free end 157 of rigid support arm 154 while the upper end of the arm includes a breakaway assembly 158 adapted to release from a header-mounted plate 160 upon impact during an accident or the

like. Breakaway assembly 158 and support arm 154 may take one of several forms such as that shown in co-pending, commonly-assigned, United States patent application Serial No. 08/336,296, filed November 8, 1994, invented by Richard R. Hook, entitled MIRROR SUPPORT BRACKET, now United States Patent No. 5,615,857, or in commonly-assigned United States Patent No. 5,100,095, the disclosures of both of which are also hereby incorporated by reference herein.--

Page 15, lines 12-30, please delete the entire paragraph and substitute the following paragraph therefor:

--With reference to Figs. 14-16, a fourth embodiment of an interior rearview mirror assembly 180 incorporating a low level light emitting source of the present invention includes an interior rearview mirror 182 of the type shown or described above in connection with embodiments 10, 120 or 150 or others as are conventionally known in the vehicle industry. Mirror assembly 182 is adjustably supported by a double ball pivot assembly 182 such as that shown at 82 above in assembly 10. The double ball pivot arm 184 is connected to a windshield mount by means of a coupler or channel-mount 186 such as that described above at 84 in connection with assembly 10. Instead of mounting the low level light emitting source on the mirror assembly or the mounting arm for the mirror assembly, however, assembly 180 includes a separate instrument housing or pod 188 mounted on coupler 186 and including a low level light emitting source 190 projecting therefrom in a fixed position for illuminating a desired portion of the vehicle interior. Housing/pod 188 is preferably of the type shown and described in co-pending, commonly-assigned United States patent application Serial No. 08/195,353, filed February 10, 1994, entitled VEHICLE INFORMATION DISPLAY, invented by Rodney K. Blank et al., now United States Patent No. 5,576,687, the disclosure of which is hereby incorporated by reference herein. Such housing/pod may include displays such as compass, temperature and clock displays; sensors such as compass sensors, GPS sensors, automatic toll sensors, automatic headlamp dimmer sensors, and ambient light sensors; and lights such as incandescent lamps for general illumination within the vehicle.--

IN THE DRAWINGS:

Please revise Figs. 9 and 20 of the drawings as shown in the attached photocopies of the drawing figures. In Fig. 9, approval of the insertion of reference numeral

60', as shown in red, is requested. In addition, substitution of reference 288 for 286 to indicate the bayonet-type lamp or bulb, as shown in Fig. 20, is also requested. Accordingly, approval of the above drawing changes is respectfully requested. These drawing changes were approved in the great-great-grandparent application, Serial No. 08/367,844.

IN THE ABSTRACT:

Page 32, lines 1-13, please delete the Abstract and substitute the following new Abstract:

--ABSTRACT

Illumination of a target location of a vehicle interior is provided by an interior rearview mirror assembly incorporating a solid-state light source comprising a light emitting diode (LED) which emits light generally downwardly from the assembly. In one form of the invention, the mirror case of the rearview mirror assembly includes at least one of an opening, a light conduit, and a fiber optic element through which the LED emits light. In another form, the LED preferably has a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA. The LED may have a dominant wavelength of at least about 530 nm. The light emitted by the LED may be selected from green, orange, yellow, amber, reddish-orange, red and blue. The vehicle interior portion may include at least one of a shift lever console and a floor console.--

A new page including this amended Abstract is included.

IN THE CLAIMS:

Please cancel claims 1-83 without prejudice.

Please add the following new claims 84-218 prior to calculation of the filing fee:

84. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case, said case including a bottom portion;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source positioned for emitting light

generally downwardly from said bottom portion of said mirror case when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered; and

wherein said mirror case includes at least one of:

a) an opening, said light emitting diode emitting light through said opening when powered,

b) a light conduit, said light emitting diode emitting light through said light conduit when powered, and

c) a fiberoptic element, said light emitting diode emitting light through said fiberoptic element when powered.

85. The mirror assembly of claim 84 wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered, said opening including a lens.

86. The mirror assembly of claim 85 wherein said lens closes said opening.

87. The mirror assembly of claim 85 wherein said lens snap-fits in said opening.

88. The mirror assembly of claim 85 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

89. The mirror assembly of claim 85 wherein said lens comprises a refractive optic.

90. The mirror assembly of claim 84 wherein said mirror case includes a light conduit, said light emitting diode emitting light through said light conduit when powered, said light conduit having an inner wall.

91. The mirror assembly of claim 90 wherein said inner wall is adapted to diffusely reflect light.

92. The mirror assembly of claim 91 wherein said inner wall comprises a diffuse reflecting material.

93. The mirror assembly of claim 90 wherein said inner wall is adapted to specularly reflect light.

94. The mirror assembly of claim 93 wherein said inner wall comprises a specularly reflecting material.

95. The mirror assembly of claim 90 wherein said light conduit is formed separate from said mirror case.

96. The mirror assembly of claim 90 wherein said light conduit is formed integral with said mirror case.

97. The mirror assembly of claim 96 wherein said light conduit is formed integral with said mirror case by molding.

98. The mirror assembly of claim 84 wherein said mirror case includes a fiberoptic element, said fiberoptic element comprising at least one of a fiberoptic cable and a fiberoptic bundle.

99. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

100. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

101. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode having a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

102. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

103. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 2 volts.

104. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

105. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

106. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

107. The mirror assembly of claim 106 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

108. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

109. The mirror assembly of claim 84 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

110. The mirror assembly of claim 84 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

111. The mirror assembly of claim 84 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

112. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

113. The mirror assembly of claim 84 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

114. The mirror assembly of claim 84 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

115. The mirror assembly of claim 84 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header area of the vehicle for mounting said assembly on the vehicle.

116. The mirror assembly of claim 84 wherein said reflective mirror element comprises a prismatic rearview mirror element.

117. The mirror assembly of claim 84 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

118. The mirror assembly of claim 117 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

119. The mirror assembly of claim 84 wherein said portion includes a shift lever console.

120. The mirror assembly of claim 119 wherein said shift lever console comprises a transmission selector indicator panel.

121. The mirror assembly of claim 119 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

122. The mirror assembly of claim 119 wherein said shift lever console is located at the floor centerline of the vehicle.

123. The mirror assembly of claim 84 wherein said portion includes a floor console.

124. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case, said case including a bottom portion;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source positioned for emitting light generally downwardly from said bottom portion of said mirror case when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered;

wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered; and

wherein said light emitting diode emits light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

125. The mirror assembly of claim 124 wherein said opening includes a lens.

126. The mirror assembly of claim 125 wherein said lens closes said opening.

127. The mirror assembly of claim 125 wherein said lens snap-fits in said opening.

128. The mirror assembly of claim 125 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

129. The mirror assembly of claim 125 wherein said lens comprises a refractive optic.

130. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

131. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode having a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

132. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode having a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

133. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

134. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 2 volts.

135. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

136. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

137. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of amber and red.

138. The mirror assembly of claim 137 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

139. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

140. The mirror assembly of claim 124 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

141. The mirror assembly of claim 124 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

142. The mirror assembly of claim 124 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

143. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

144. The mirror assembly of claim 124 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

145. The mirror assembly of claim 124 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

146. The mirror assembly of claim 124 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header area of the vehicle for mounting said assembly on the vehicle.

147. The mirror assembly of claim 124 wherein said reflective mirror element comprises a prismatic rearview mirror element.

148. The mirror assembly of claim 124 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

149. The mirror assembly of claim 148 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

150. The mirror assembly of claim 124 wherein said portion includes a shift lever console.

151. The mirror assembly of claim 150 wherein said shift lever console comprises a transmission selector indicator panel.

152. The mirror assembly of claim 150 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

153. The mirror assembly of claim 150 wherein said shift lever console is located at the floor centerline of the vehicle.

154. The mirror assembly of claim 124 wherein said portion includes a floor console.

155. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case, said case including a bottom portion;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source positioned for emitting light generally downwardly from said bottom portion of said mirror case when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered;

wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered; and

wherein said light emitting diode has a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

156. The mirror assembly of claim 155 wherein said opening includes a lens.

157. The mirror assembly of claim 156 wherein said lens closes said opening.

158. The mirror assembly of claim 156 wherein said lens snap-fits in said opening

159. The mirror assembly of claim 156 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

160. The mirror assembly of claim 156 wherein said lens comprises a refractive optic.

161. The mirror assembly of claim 155 wherein said light emitting diode emits light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

162. The mirror assembly of claim 155 wherein said light emitting diode has a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

163. The mirror assembly of claim 155 wherein said light emitting diode has a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

164. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

165. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 2 volts.

166. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

167. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

168. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of amber and red.

169. The mirror assembly of claim 168 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

170. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

171. The mirror assembly of claim 155 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

172. The mirror assembly of claim 155 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

173. The mirror assembly of claim 155 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

174. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

175. The mirror assembly of claim 155 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

176. The mirror assembly of claim 155 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

177. The mirror assembly of claim 155 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header area of the vehicle for mounting said assembly on the vehicle.

178. The mirror assembly of claim 155 wherein said reflective mirror element comprises a prismatic rearview mirror element.

179. The mirror assembly of claim 155 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

180. The mirror assembly of claim 179 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

181. The mirror assembly of claim 155 wherein said portion includes a shift lever console.

182. The mirror assembly of claim 181 wherein said shift lever console comprises a transmission selector indicator panel.

183. The mirror assembly of claim 181 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

184. The mirror assembly of claim 181 wherein said shift lever console is located at the floor centerline of the vehicle.

185. The mirror assembly of claim 155 wherein said portion includes a floor console.

186. An interior rearview mirror assembly for mounting on a vehicle comprising:

a mirror case;

a reflective mirror element;

a support for securing said assembly on the vehicle;

a solid-state light source, said light source incorporated as part of said mirror assembly and positioned for emitting light generally downwardly from a bottom portion of said assembly when said assembly is mounted on the vehicle;

said solid-state light source comprising a light emitting diode;

said solid-state light source positioned to emit light to provide illumination of a portion of the vehicle interior below said mirror assembly when said assembly is mounted on the vehicle and when said solid-state light source is electrically powered;

wherein said light emitting diode has a luminous intensity of at least 500 mcd when operated at a forward current of 20 mA.

187. The mirror assembly of claim 186 wherein said mirror case includes an opening, said light emitting diode emitting light through said opening when powered

188. The mirror assembly of claim 187 wherein said opening includes a lens.

189. The mirror assembly of claim 188 wherein said lens closes said opening.

190. The mirror assembly of claim 188 wherein said lens snap-fits in said opening.

191. The mirror assembly of claim 188 wherein said lens comprises at least one of a Fresnel lens, a binary optic, a refractive optic and a holographic optic.

192. The mirror assembly of claim 188 wherein said lens comprises a refractive optic.

193. The mirror assembly of claim 186 wherein said light emitting diode emits light having a color selected from the group consisting of green, orange, yellow, amber, reddish-orange, red and blue.

194. The mirror assembly of claim 186 wherein said light emitting diode has a luminous intensity of at least 700 mcd when operated at a forward current of 20 mA.

195. The mirror assembly of claim 186 wherein said light emitting diode has a luminous intensity in the range of about 500 mcd to about 7000 mcd when said solid-state light source is powered in the vehicle.

196. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 1 volt.

197. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage of at least about 2 volts.

198. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode operated at a forward voltage less than about 5 volts.

199. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode that emits light with a dominant wavelength within the range of about 530 nm to about 680 nm.

200. The mirror assembly of claim 199 wherein said solid-state light source comprises a light emitting diode emitting light having a color selected from the group consisting of amber and red.

201. The mirror assembly of claim 200 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

202. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode formed from a material including at least one of aluminum, indium, gallium, arsenic and phosphorous.

203. The mirror assembly of claim 186 wherein said solid-state light source operates at a current less than about 200 mA when said solid-state light source is mounted and operated in the vehicle.

204. The mirror assembly of claim 186 wherein said solid-state light source operates at a current less than about 100 mA when said solid-state light source is mounted and operated in the vehicle.

205. The mirror assembly of claim 186 wherein said solid-state light source operates at a current less than about 50 mA when said solid-state light source is mounted and operated in the vehicle.

206. The mirror assembly of claim 186 wherein said solid-state light source comprises a light

emitting diode operated at a current within the range of about 20 mA to about 100 mA when said solid-state light source is mounted and operated in the vehicle.

207. The mirror assembly of claim 186 wherein said solid-state light source comprises a light emitting diode providing illumination of between about 0.2 and 4.0 lux at a distance of about 22 to 26 inches from said diode.

208. The mirror assembly of claim 186 wherein the vehicle includes a windshield, said support being adapted for connection to the windshield for mounting said assembly on the vehicle.

209. The mirror assembly of claim 186 wherein the vehicle includes a windshield and a header area adjacent the windshield, said support being adapted for connection to the header area of the vehicle for mounting said assembly on the vehicle.

210. The mirror assembly of claim 186 wherein said reflective mirror element comprises a prismatic rearview mirror element.

211. The mirror assembly of claim 186 wherein said reflective mirror element comprises an electro-optic rearview mirror element.

212. The mirror assembly of claim 211 wherein said electro-optic rearview mirror element comprises an electrochromic rearview mirror element.

213. The mirror assembly of claim 186 wherein said portion includes a shift lever console.

214. The mirror assembly of claim 213 wherein said shift lever console comprises a transmission selector indicator panel.

215. The mirror assembly of claim 213 wherein said shift lever console comprises at least one of a transmission selector indicator panel, a bin, a cup holder, an ashtray and a switch.

216. The mirror assembly of claim 213 wherein said shift lever console is located at the floor centerline of the vehicle.

217. The mirror assembly of claim 186 wherein said portion includes a floor console.

218. The mirror assembly of claim 186 wherein said light emitting diode emits light with a dominant wavelength of at least about 530 nm.

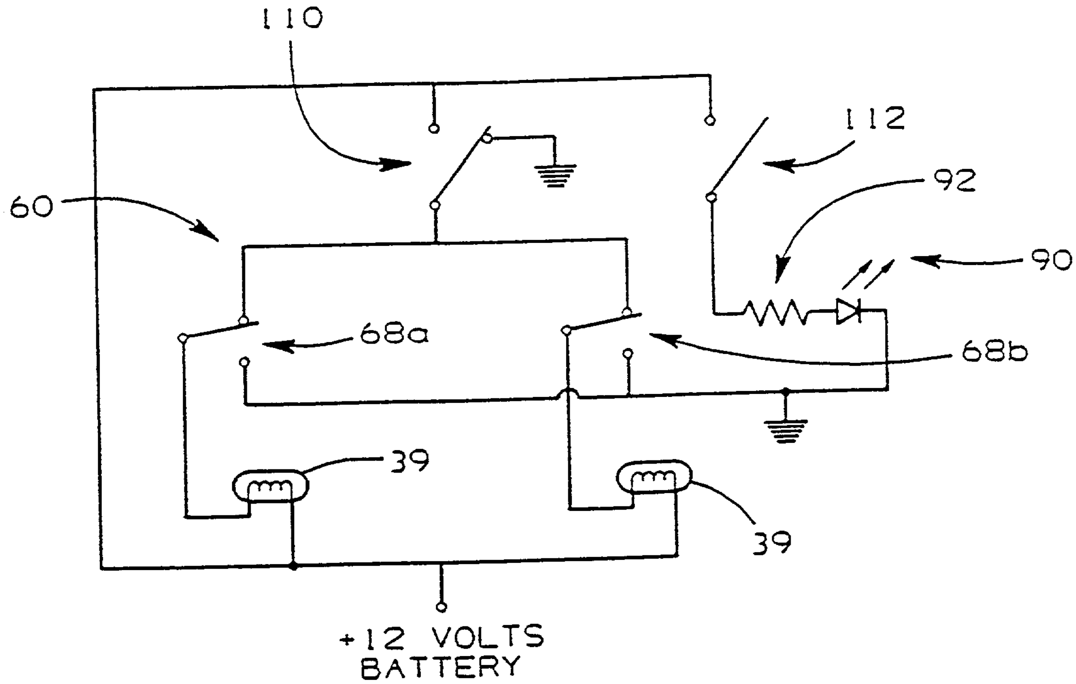
110
112
92
60
90
68a
68b
39
39
+12 VOLTS
BATTERY

FIG. 8

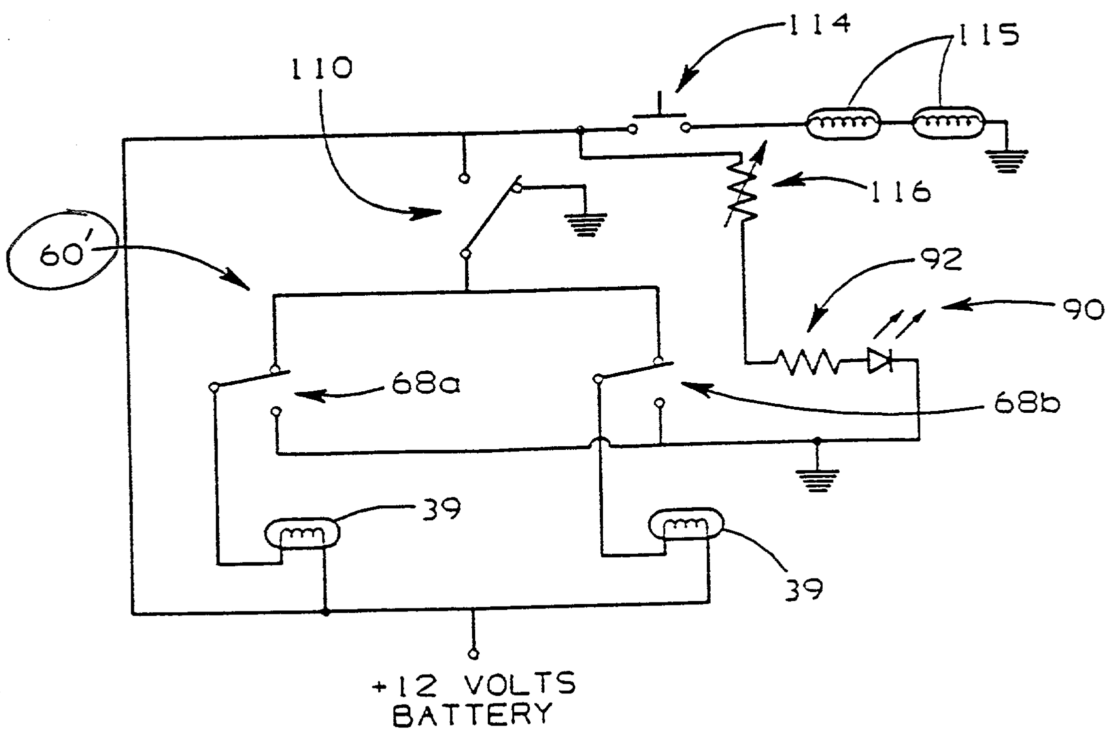
114
115
110
116
60'
92
90
68a
68b
39
39
+12 VOLTS
BATTERY

FIG. 9

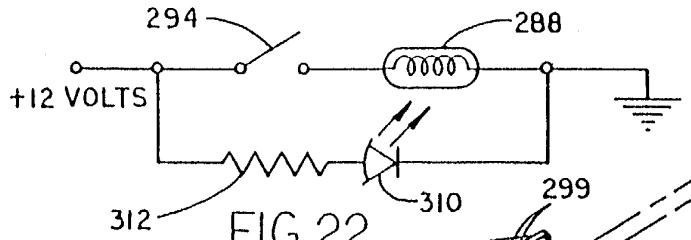

FIG. 22

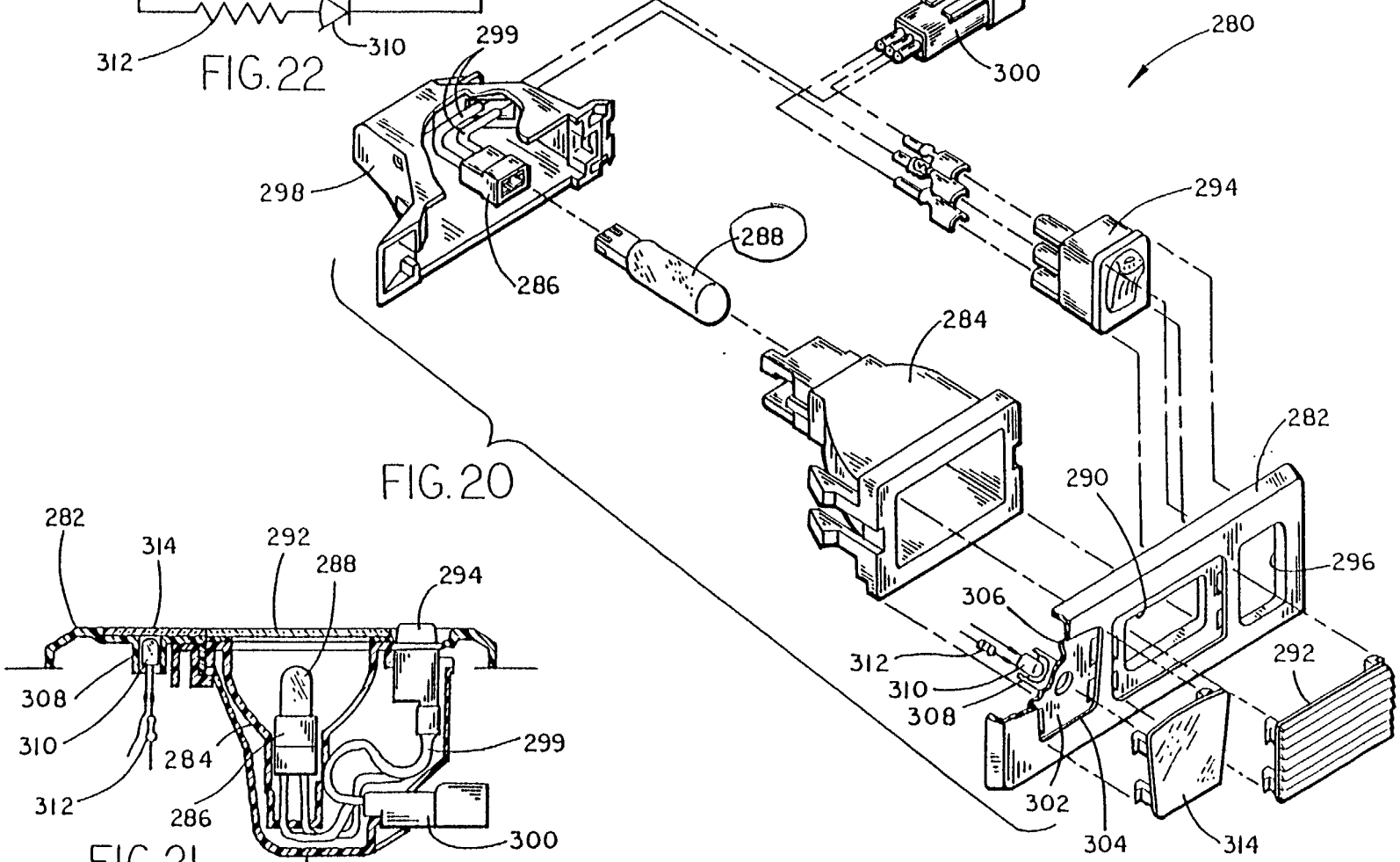

FIG. 20

FIG. 21